IN THE CLAIMS:

Please reconsider the claims as follows:

LISTING OF THE CLAIMS:

1. (previously presented) A method, comprising:

identifying a set of virtual private network (VPN) customers, at least one mobile access point (MAP) and at least one customer premise equipment (CPE) associated with each VPN customer, and at least one Internet Protocol (IP) service gateway (IPSG) for facilitating VPN tunneling between a MAP and a CPE, wherein each MAP is geographically remote from each IPSG; and

selecting a subset of IPSGs to maximize total profit resulting from provisioning a subset of VPN customers on the selected IPSGs, wherein said total profit from all the customers comprises the sum of profits from each customer (l), where for each customer profit (U^l) equals weighted revenue (γV^l) less cost (C^l), ($U^l = \gamma V^l - C^l$), wherein said cost per customer comprises a total tunnel bandwidth cost (C^l_C) from said MAP to said CPE, and a cost (C^l_V) of provisioning an IPSG node.

2. (original) The method of claim 1, wherein γ represents relative weight of revenue compared to total cost for customer l.

3. (original) The method of claim 1, wherein said total tunnel bandwidth cost comprises a dynamic tunnel bandwidth cost between said MAP and said provisioned IPSG, and a static tunnel bandwidth cost between said provisioned IPSG and said CPE.

4. (original) The method of claim 1, wherein only a single tunnel is established between said provisioned IPSG and said CPE, even during instances where traffic from multiple MAPs are going through said provisioned IPSG to reach said CPE.

5. (original) The method of claim 1, wherein in an instance said provisioned IPSG sends traffic to more than one CPE, said provision cost is counted only once.

6. (original) The method of claim 1, wherein said cost per customer l is determined by $C^l = \left(\sum_{i \in P, j \in Q} c^l{}_{ij} + \beta \sum_{j \in Q, k \in R_l} d^l{}_{jk} \right) + \alpha \sum_{j \in Q} f_j y^l{}_j$, where $c^l{}_{ij}$ is a bandwidth cost associated with sending traffic from a MAP node i to an IPSG node j, $d^l{}_{jk}$ is a bandwidth cost associated with sending traffic from said IPSG node j to said CPE node k, β represents a weighing factor with respect to said shared static tunnel, f_j is a provisioning cost associated with using said IPSG node j , $y^l{}_j$ is a binary variable denoting whether said IPSG j is provisioned for a provisioned customer to send traffic to at least one of its CPEs, and α is a weighing factor for provision cost over total bandwidth cost.

7. (original) The method of claim 6, wherein said bandwidth cost ($c^l{}_{ij}$) associated with sending traffic from a MAP node i to an IPSG node j comprises the product of unit bandwidth cost (a_{ij}) between said MAP node i and said IPSG node j, and a sum of traffic $\left(\sum_{k \in R_l} s^l{}_{ijk}, \forall i \in P, \forall j \in Q \right)$ from MAP node i to said CPE node k that is directed through IPSG node j.

8. (original) The method of claim 6, wherein said bandwidth cost ($d^l{}_{jk}$) associated with sending traffic from an IPSG node j to a CPE node k comprises the product of unit bandwidth cost ($e^l{}_{jk}$) between said IPSG node j and said CPE node k, and a total amount of traffic $\left(\sum_{i \in P} s^l{}_{ijk}, \forall j \in Q, \forall k \in R_l \right)$ from MAP node i to said CPE node k that is directed through IPSG node j.

9. (original) The method of claim 6, wherein said total amount of traffic $\left(\sum_{k \in R_l} s^l_{ijk}\right)$ from MAP node i to said IPSG node j is less than or equal to total bandwidth capacity (g_{ij}) between said MAP node i and said IPSG node j.

10. (original) The method of claim 6, wherein said total amount of traffic $\left(\sum_{i \in P} s^l_{ijk}\right)$ from said IPSG node j to said CPE node k is less than or equal to total bandwidth capacity (h^l_{jk}) between said IPSG node j and said CPE node k.

11. (previously presented) A virtual private network (VPN) system architecture, comprising:

means for identifying a set of virtual private network (VPN) customers, at least one mobile access point (MAP) and at least one customer premise equipment (CPE) associated with each VPN customer, and at least one Internet Protocol (IP) service gateway (IPSG) for facilitating VPN tunneling between a MAP and a CPE, wherein each MAP is geographically remote from each IPSG; and

means for selecting a subset of IPSGs to maximize total profit resulting from provisioning a subset of VPN customers on the selected IPSGs, wherein said total profit from all the customers comprises the sum of profits from each customer (l), where for each customer profit (U^l) equals weighted revenue (γV^l) less cost (C^l), ($U^l = \gamma V^l - C^l$), wherein said cost per customer comprises a total tunnel bandwidth cost (C^l_C) from said MAP to said CPE, and a cost (C^l_V) of provisioning an IPSG node.

12. (previously presented) The system architecture of claim 11, wherein γ represents relative weight of revenue compared to total cost for customer l.

13. (previously presented) The system architecture of claim 11, wherein said total tunnel bandwidth cost comprises a dynamic tunnel bandwidth cost between said MAP

and said provisioned IPSG, and a static tunnel bandwidth cost between said provisioned IPSG and said CPE.

14. (previously presented) The system architecture of claim 11, wherein only a single tunnel is established between said provisioned IPSG and said CPE, even during instances where traffic from multiple MAPs are going through said provisioned IPSG to reach said CPE.

15. (previously presented) The system architecture of claim 11, wherein in an instance said provisioned IPSG sends traffic to more than one CPE, said provision cost is counted only once.

16. (previously presented) The system architecture of claim 11, wherein said cost per customer l is determined by $C^l = \left(\sum_{i \in P, j \in Q} c^l{}_{ij} + \beta \sum_{j \in Q, k \in R_l} d^l{}_{jk} \right) + \alpha \sum_{j \in Q} f_j y^l{}_j$, where c^l_{ij} is a bandwidth cost associated with sending traffic from a MAP node i to an IPSG node j, d^l_{jk} is a bandwidth cost associated with sending traffic from said IPSG node j to said CPE node k, β represents a weighing factor with respect to said shared static tunnel, f_j is a provisioning cost associated with using said IPSG node, y^l_j is a binary variable denoting whether said IPSG j is provisioned for a provisioned customer to send traffic to at least one of its CPEs, and α is a weighing factor for provision cost over total bandwidth cost.

17. (previously presented) The system architecture of claim 16, wherein said bandwidth cost (c^l_{ij}) associated with sending traffic from a MAP node i to an IPSG node j comprises the product of unit bandwidth cost (a_{ij}) between said MAP node i and said IPSG node j, and a sum of traffic $\left(\sum_{k \in R_l} s^l{}_{ijk}, \forall i \in P, \forall j \in Q \right)$ from MAP node i to said CPE node k that is directed through IPSG node j.

18. (previously presented) The system architecture of claim 16, wherein said bandwidth cost (d^l_{jk}) associated with sending traffic from an IPSG node j to a CPE node k comprises the product of unit bandwidth cost (e^l_{jk}) between said IPSG node j and said CPE node k, and a total amount of traffic $\left(\sum_{i \in P} s^l{}_{ijk}, \forall j \in Q, \forall k \in R_l\right)$ from MAP node i to said CPE node k that is directed through IPSG node j.

19. (previously presented) The system architecture of claim 16, wherein said total amount of traffic $\left(\sum_{k \in R_l} s^l{}_{ijk}\right)$ from MAP node i to said IPSG node j is less than or equal to total bandwidth capacity (g_{ij}) between said MAP node i to said IPSG node j.

20. (previously presented) The system architecture of claim 16, wherein said total amount of traffic $\left(\sum_{i \in P} s^l{}_{ijk}\right)$ from said IPSG node j to said CPE node k is less than or equal to total bandwidth capacity (h^l_{jk}) between said IPSG node j and said CPE node k.

21. (original) The system architecture of claim 11, wherein said MAPs provide dynamic switching and routing of data connections, while said IPSGs provide VPN services.

22. (previously presented) A computer readable medium for storing instructions that, when executed by a processor, perform a method for optimally provisioning connectivity for network-based mobile virtual private network (VPN) services, comprising:

identifying a set of virtual private network (VPN) customers, at least one mobile access point (MAP) and at least one customer premise equipment (CPE) associated with each VPN customer, and at least one Internet Protocol (IP) service gateway (IPSG) for facilitating VPN tunneling between a MAP and a CPE, wherein each said MAP is geographically remote from each said IPSG; and

selecting a subset of IPSGs to maximize total profit resulting from provisioning a subset of VPN customers on the selected IPSGs, wherein said total profit from all the customers comprises the sum of profits from each customer (l), where for each customer profit (U^l) equals weighted revenue (γV^l) less cost (C^l) ($U^l = \gamma V^l - C^l$), wherein said cost per customer comprises a total tunnel bandwidth cost ($C^l{}_C$) from said MAP to said CPE, and a cost ($C^l{}_V$) of provisioning an IPSG node.